T13D01 – (13.1) Chlorides and Oxides Across Period 3

Name……..

1. 13.1.1 Explain the physical states (under standard conditions) and electrical conductivity (in the molten state) of the chlorides and oxides of the elements in period 3 in terms of their bonding and structure. (3)
    a. Reactions across period three oxides:
        i. What is the trend of acidic properties across period 3?

        ii. Rewrite the equation of each of the period 3 oxides in water:

        iii. What are the trends in physical states?

        iv. Demonstrate the trend in formulas across the period 3 oxides and note the ratio of the element to oxygen:

        v. What is the trend in conductivity across the period 3 oxides?

        vi. Complete the equation for the formation of each period 3 oxide:

Name	Description of Element + O_2	Equation for Reaction
Na	Burns an orange flame → white solid	
Mg	Burns bright white → white solid	
Al	Burns on heating in O_2 → white solid	
Si	Burns on heating in O_2 → white solid	
P	White P spontaneously burns → white (s)	Limited air: Excess air:
S	Burns with blue flame → colorless gas	
Cl	Does not directly react with oxygen	

2. 13.1.2 Describe the reactions of chlorine and the chlorides referred to in 13.1.1 with water. (2)
    a. Reactions across period three chlorides:
        i. Complete the following table for the formation of each chloride:

Name	Description of Reaction	Equation for Reaction
Na	Hot Na → white solid	
Mg	Hot Mg → white solid	
Al	Reacts on heating → pale yellow solid	
Si	Reacts on heating → colorless liquid	
P	White P reacts with limited Cl_2 → colorless liquid	Limited Cl: Excess Cl:

        ii. Sodium Chloride:

iii. Magnesium Chloride:

iv. Aluminum Chloride:

v. Silicon tetrachloride:

vi. Phosphorus (tri/penta)chloride:

vii. Sulfur Chloride:

viii. Chlorine Chloride:

b. Complete the following table for the properties of each of the chlorides:

Element	**Na**	**Mg**	**Al**	**Si**	**P**	**Cl**
Formula						
State						
Ox. #						
Structure						
M.P. (K)						
B.P. (K)						
+ H_2O =						
Conduc.(l)						

c. Summary of trends for chlorides:

i. Physical States:

ii. Formulas:

iii. Acid Base Character:

iv. Conductivity: